

M829E3 120-MM APFSDS-T CARTRIDGE



Army ACAT II Program

Total Number of Systems:	65,000
Total Program Cost (TY\$):	\$481.6M
Average Unit Cost (TY\$):	\$5K
Full-rate production:	FY03

Prime Contractor

Alliant Techsystems

SYSTEM DESCRIPTION & CONTRIBUTION TO JOINT VISION 2020

The M829E3 Armor-Piercing Fin-Stabilized Discarding Sabot-Tracer (APFSDS-T) cartridge is one of the 120mm main gun rounds designed for the Abrams tank. It is a Kinetic Energy (KE) round that fires a depleted uranium rod designed to penetrate and destroy enemy heavy armored vehicles. The focus of M829E3 development is on propulsion improvements. The design is driven by the need to counter KE-effective Explosive Reactive Armor (ERA) and the desire to destroy targets at longer range than is possible with the current M829A2.

The improved tank round will support the *dominant maneuver* force aspect of *Joint Vision 2020* by enhancing the lethality of the Abrams main battle tank.

Due to the funding threshold, the M829E3 program does not require operational test oversight from this office. However, the Army nominated this program for LFT&E oversight based on projected program cost.

BACKGROUND INFORMATION

DOT&E/LFT involvement in this program includes both lethality and vulnerability test and evaluation. System lethality will be assessed with respect to expected threat tanks. The Abrams tank will be assessed to ensure that there is no increase in system vulnerability when carrying the M829E3 as compared to the current ammunition (M829A2). In 1QFY00, DOT&E approved the LFT&E Strategy, which included combined lethality and vulnerability test requirements. The strategy includes the agreement that data from developmental testing and production qualification testing against range targets and shotline simulant targets will be leveraged as much as possible for lethality evaluation. Data for the vulnerability evaluation will rely on simulated and full-scale ammunition compartment tests.

An Engineering and Manufacturing Development (EMD) contract was awarded in 4QFY98. EMD developmental testing began in FY99 and continued through FY00.

TEST & EVALUATION ACTIVITY

EMD test activity primarily consisted of component level testing of the penetrator and the propulsion system. The test data supported various design trade-offs and material comparisons. If any of this data is relevant to the final production configuration, it will be used to support the EMD lethality analysis.

TEST & EVALUATION ASSESSMENT

The lethality portion of the approved LFT&E Strategy includes a plan for more than 100 shots with M829E3 penetrators to establish a baseline for comparison with more than 300 shots with M829A2 penetrators. These shots will be fired against a combination of semi-infinite Rolled Homogeneous Armor (RHA) with and without ERA, finite RHA, and various range targets with and without ERA. The different types of armor will test the depth of penetration the round is capable of.

Production Qualification Test (PQT) will consist of a two-phase series of shots against range targets. Phase I includes 67 firings of the production-representative M829E3 against range targets with and without ERA, and Phase II includes 36 shots against targets designed to represent specific shotlines through threat vehicles with and without ERA. Specific data will be gathered on the behind armor debris performance of the new design versus the in-service M829A2.

Vulnerability testing will include five tests against simulated ammunition compartments and three tests against full-scale ammunition compartments tests with actual Abrams turret and hull ammo stowage.

CONCLUSIONS, RECOMMENDATIONS AND LESSONS LEARNED

The provision for use of shotline simulant targets in Phase II PQT represents an intelligent approach to realistic lethality testing, given the difficulties inherent in acquiring representative threat targets and testing with ERA and depleted uranium ammunition.